

THE ASTROPHYSICAL JOURNAL

Founded in 1895 by George E. Hale and James E. Keeler

HELMUT A. ABT

Managing Editor

Kitt Peak National Observatory

A. DALGARNO

Letters Editor

Center for Astrophysics

EUGENE H. AVRETT

Deputy Letters Editor

Center for Astrophysics

YERVANT TERZIAN

Associate Editor

Cornell University

VIRGINIA TRIMBLE

Associate Editor

University of Maryland and
University of California, Irvine

F. DAVID A. HARTWICK

Associate Letters Editor

University of Victoria

MICHAEL JURA

Associate Letters Editor

University of California, Los Angeles

EDWIN E. SALPETER

Associate Letters Editor

Cornell University

AAS PUBLICATIONS BOARD

CATHERINE PILACHOWSKI (1989-1992), *Chairperson*

Kitt Peak National Observatory

FRANÇOIS SCHWEIZER (1990-1993)

Carnegie Institution of Washington

JACQUELINE H. VAN GORKOM (1990-1993)

Columbia University

JAMES W. LIEBERT (1991-1994)

University of Arizona

KRISTEN SELLGREN (1991-1994)

Ohio State University

H. J. G. L. M. LAMERS (1992-1995)

SRON Laboratory for Space Research, The Netherlands

HUGH M. VAN HORN (1992-1995)

University of Rochester

Production Manager: TULIE O'CONNOR

Chief Manuscript Editor: GERALDINE BRADY

Manuscript Editors: WALTER G. GLASCOFF III, BETH GARRISON, KAREN LESLIE BOYD, THAD A. DORIA, AND DAVID E. ANDERSON

Production Staff: ELIZABETH HUGHES, GRACE S. WHITE, IVAN BRUNETTI, AZISTI DEMBOWSKI, AND VIRGINIA M. BOYCE

VOLUME 395, PART 1
1992 AUGUST 10 AND AUGUST 20

PUBLISHED BY THE UNIVERSITY OF CHICAGO PRESS FOR
THE AMERICAN ASTRONOMICAL SOCIETY

© 1992 BY THE AMERICAN ASTRONOMICAL SOCIETY. ALL RIGHTS RESERVED.
PUBLISHED THREE TIMES A MONTH

COMPOSED BY SANTYPE INTERNATIONAL LIMITED, SALISBURY, ENGLAND
PRINTED BY CAPITAL CITY PRESS, INC.
MONTPELIER, VERMONT, U.S.A.

THE ASTROPHYSICAL JOURNAL
CONTENTS OF VOLUME 395, PART 1

1992 AUGUST 10, Number 1

	<i>Page</i>	<i>Fiche</i>
STATISTICS OF THE COSMIC MACH NUMBER FROM NUMERICAL SIMULATIONS OF A COLD DARK MATTER UNIVERSE <i>Yasushi Suto, Renyue Cen, & Jeremiah P. Ostriker</i>	1	140-B1
QSO ABSORBERS: EVIDENCE FOR A PRIMEVAL GALAXY POPULATION <i>Arati Chokshi</i>	21	140-D5
ON MODELING A RELATIVISTIC HIERARCHICAL (FRACTAL) COSMOLOGY BY TOLMAN'S SPACETIME. II. ANALYSIS OF THE EINSTEIN-DE SITTER MODEL <i>Marcelo B. Ribeiro</i>	29	140-E1
COSMOLOGICAL PERTURBATIONS AND THE PHYSICAL MEANING OF GAUGE-INVARIANT VARIABLES <i>Marco Bruni, Peter K. S. Dunsby, & George F. R. Ellis</i>	34	140-E7
COVARIANT PERTURBATIONS IN A MULTIFLUID COSMOLOGICAL MEDIUM <i>Peter K. S. Dunsby, Marco Bruni, & George F. R. Ellis</i>	54	140-G1
THE LARGE-SCALE VELOCITY FIELD BEYOND THE LOCAL SUPERCLUSTER <i>Mingsheng Han</i>	75	141-A9
REPRODUCING THE LOCAL AND GLOBAL MORPHOLOGICAL SEGREGATION BETWEEN S AND S0 GALAXIES IN RICH CLUSTERS BY SIMPLE RAM-PRESSURE STRIPPING <i>José M. Solanes & Eduardo Salvador-Solé</i>	91	141-C1
CHARACTERISTIC-BASED MODELS FOR THE EVOLUTION OF COOLING FLOWS <i>Stephen D. Murray & Steven A. Balbus</i>	99	141-C11
DYNAMICAL EVOLUTION OF HIGHLY INCLINED RINGS <i>Dimitris M. Christodoulou, Neal Katz, Hans-Walter Rix, & Asao Habe</i>	113	141-E1
THE POTENTIAL ENERGY TENSORS FOR SUBSYSTEMS <i>R. Caimmi & L. Secco</i>	119	141-E11
PECULIAR ROTATIONS OF MOLECULAR GAS IN M82: KEPLERIAN DISK AND SLOWLY ROTATING HALO <i>Y. Sofue, H.-P. Reuter, M. Krause, R. Wielebinski, & N. Nakai</i>	126	141-F5
INTERSTELLAR DUST FROM THE MILKY WAY TO THE MAGELLANIC CLOUDS <i>Yichuan C. Pei</i>	130	141-G1
PRESSURE-CONFINED CLUMPS IN MAGNETIZED MOLECULAR CLOUDS <i>Frank Bertoldi & Christopher F. McKee</i>	140	142-A1
ON THE ANGULAR EXTENT OF THE GALACTIC 1.8 MeV LINE EMISSION FROM RADIOACTIVE ^{26}Al <i>Martin Varendoff & Volker Schönfelder</i>	158	142-B7
THE COMPRESSION OF THE M-0.02-0.07 MOLECULAR CLOUD BY THE SAGITTARIUS A EAST SHELL SOURCE <i>E. Serabyn, J. H. Lacy, & J. M. Achtermann</i>	166	142-C1
NEAR-INFRARED OBSERVATIONS OF AFGL 618. II. THE ATOMIC SPECTRUM <i>Douglas M. Kelly, William B. Latter, & G. H. Rieke</i>	174	142-D1
EFFECT OF MAGNETIC HELICITY UPON RECTILINEAR PROAGATION OF CHARGED PARTICLES IN RANDOM MAGNETIC FIELDS <i>James A. Earl</i>	185	142-E1
AN RR LYRAE PERIOD SHIFT IN TERMS OF THE FOURIER PARAMETER ϕ_{31} <i>Christine M. Clement, Michael Jankulak, & Norman R. Simon</i>	192	142-E9

CONTENTS

	Page	Fiche
THE α -PROCESS AND THE r -PROCESS <i>S. E. Woosley & Robert D. Hoffman</i>	202	142-F7
A NEW CLASS OF g -MODES IN NEUTRON STARS <i>Andreas Reisenegger & Peter Goldreich</i>	240	143-B7
MAGNETIC FIELD DECAY IN ISOLATED NEUTRON STARS <i>Peter Goldreich & Andreas Reisenegger</i>	250	143-C5
A COMPARATIVE STUDY OF SYNCHRONIZATION AND CIRCULARIZATION IN CLOSE BINARIES <i>Jean-Louis Tassoul & Monique Tassoul</i>	259	143-D1
VLBI OBSERVATIONS OF THE X-RAY BINARY LS I +61°303 <i>A. R. Taylor, H. T. Kenny, R. E. Spencer, & A. Tzioumis</i>	268	143-D11
AN IONIZED ACCRETION DISK IN CYGNUS X-1 <i>C. Done, J. S. Mulchaey, R. F. Mushotzky, & K. A. Arnaud</i>	275	143-E5
THE ANOMALOUS EXTINCTION CURVE IN THE DIRECTION OF ρ OPHIUCHI FROM 950 TO 1180 Å <i>James C. Green, Theodore P. Snow, Timothy A. Cook, Webster C. Cash, & Orion Poplawski</i>	289	143-E9
ULTRAVIOLET OBSERVATIONS OF THE SYMBIOTIC STAR AS 296 <i>A. Gutiérrez-Moreno, H. Moreno, & W. A. Feibelman</i>	295	143-G1
THE ULTRAVIOLET AND VISIBLE SPECTRUM OF THE POLYCYCLIC AROMATIC HYDROCARBON $C_{10}H_8^+$: POSSIBLE CONTRIBUTIONS TO THE DIFFUSE INTERSTELLAR BANDS AND TO THE ULTRAVIOLET-VISIBLE EXTINCTION <i>F. Salama & L. J. Allamandola</i>	301	143-G9
THE EFFECT OF AN INCLINED MAGNETIC FIELD ON SOLAR OSCILLATION FREQUENCIES <i>Philip R. Goode & Michael J. Thompson</i>	307	144-A1

1992 AUGUST 20, Number 2

A SEARCH FOR ANISOTROPY IN THE COSMIC MICROWAVE BACKGROUND ON INTERMEDIATE ANGULAR SCALES <i>D. C. Alsop, E. S. Cheng, A. C. Clapp, D. A. Cottingham, M. L. Fischer, J. O. Gundersen, E. Kreysa, A. E. Lange, P. M. Lubin, P. R. Meinhold, P. L. Richards, & G. F. Smoot</i>	317	146-B5
ARCMINUTE FLUCTUATIONS IN THE MICROWAVE BACKGROUND FROM CLUSTERS OF GALAXIES <i>M. Markevitch, G. R. Blumenthal, W. Forman, C. Jones, & R. A. Sunyaev</i>	326	146-C1
THE ANGULAR THREE-POINT FUNCTION OF GALAXY CLUSTERS <i>Stefano Borgani, Yipeng Jing, & Manolis Plionis</i>	339	146-D5
THE VELOCITY-DISTANCE RELATION FOR GALAXIES ON A BUBBLE <i>Gregory D. Bothun, Margaret J. Geller, Michael J. Kurtz, John P. Huchra, & Rudolph E. Schild</i>	347	146-E5
NEW CONSTRAINTS AND IMPROVEMENTS ON OSCILLATING PHYSICS <i>Robert G. Crittenden & Paul J. Steinhardt</i>	360	146-F9
EXPANDING PHOTOSPHERES OF TYPE II SUPERNOVAE AND THE EXTRAGALACTIC DISTANCE SCALE <i>Brian P. Schmidt, Robert P. Kirshner, & Ronald G. Eastman</i>	366	146-G7
USING ELECTRON SCATTERING TO PROBE THE ENVIRONMENT OF CLUSTER COOLING FLOWS <i>Michael W. Wise & Craig L. Sarazin</i>	387	147-B5
NEAR-INFRARED BROAD-LINE PROFILES IN LOW-REDSHIFT QSOs <i>Keith L. Thompson</i>	403	147-C13
A DYNAMICAL ANALYSIS OF THE BARRED SPIRAL GALAXY NGC 3359 <i>Roger Ball</i>	418	147-E5
VLA OBSERVATIONS OF THE INNER LOBES OF CENTAURUS A <i>David A. Clarke, Jack O. Burns, & Michael L. Norman</i>	444	147-G7
X-RAY SPECTRAL STRUCTURE OF THE SEYFERT GALAXY NGC 6814 <i>M. Yamauchi, M. Matsuoka, N. Kawai, & A. Yoshida</i>	453	148-A13

CONTENTS

v

	Page	Fiche
HIGH-RESOLUTION 12.4 MICRON IMAGES OF THE STARBURST REGION IN M82 <i>C. M. Telesco & D. Y. Gezari</i>	461	148-B11
ABUNDANCES FOR GIANT STARS IN THE DRACO DWARF GALAXY <i>Matthew D. Lehnert, R. A. Bell, James E. Hesser, & J. B. Oke</i>	466	148-C9
HYDRODYNAMICS OF THE HOT COMPONENT OF THE GALACTIC HALO. II. RADIATIVE AND DYNAMICAL INSTABILITIES <i>A. Ferrara & G. Einaudi</i>	475	148-D9
DETERMINATION OF THE He ⁺ /H ⁺ RATIO FROM α , β , AND γ RADIO RECOMBINATION LINES <i>M. Peimbert, L. F. Rodriguez, T. M. Bania, R. T. Rood, & T. L. Wilson</i>	484	148-E9
EVIDENCE FOR A WIND-SWEPT CAVITY IN HH 34? <i>Alexander Rudolph & William J. Welch</i>	488	148-F3
RADIO CONTINUUM FROM THE POWERING SOURCES OF THE RNO 43, HARO 4-255 FIR, B335, AND PV CEPHEI OUTFLOWS AND FROM THE HERBIG-HARO OBJECT 32A <i>G. Anglada, L. F. Rodriguez, J. Cantó, R. Estalella, & J. M. Torrelles</i>	494	148-G1
GLOBAL ASPECTS OF DYNAMICS AND STAR FORMATION IN TAURUS <i>Ana I. Gomez de Castro & Ralph E. Pudritz</i>	501	148-G13
NEAR-INFRARED OBSERVATIONS OF YOUNG STELLAR OBJECTS IN THE ρ OPHIUCHI DARK CLOUD <i>Thomas P. Greene & Erick T. Young</i>	516	149-B5
MODEL SCATTERING ENVELOPES OF YOUNG STELLAR OBJECTS. I. METHOD AND APPLICATION TO CIRCUMSTELLAR DISKS <i>Barbara A. Whitney & Lee Hartmann</i>	529	149-D1
PULSAR NEBULAE IN SUPERNOVAE <i>Roger A. Chevalier & Claes Fransson</i>	540	149-E3
MAGNETIZED STIMULATED SCATTERING IN PULSAR WINDS <i>Mark W. Sincell & Julian H. Krolik</i>	553	149-F7
THE POLAR CAP STRUCTURE OF THE X-RAY PULSAR 4U 1538-52 <i>T. Bulik, P. Mészáros, J. W. Woo, F. Nagase, & K. Makishima</i>	564	149-G9
X-RAY EMISSION FROM SINGLE MAGNETIC EARLY-TYPE STARS <i>V. V. Usov & D. B. Melrose</i>	575	150-B1
LONG-TERM VARIABILITY IN LOW-MASS X-RAY BINARIES: A STUDY USING DATA FROM VELA 5B <i>Alan P. Smale & James C. Lochner</i>	582	150-B13
LINEAR STABILITY ANALYSIS OF SPHERICAL ACCRETION FLOWS ONTO COMPACT OBJECTS <i>John C. Houck & Roger A. Chevalier</i>	592	150-D1
ON THE EFFICIENCY OF EKMAN PUMPING FOR SYNCHRONIZATION IN CLOSE BINARIES <i>Monique Tassoul & Jean-Louis Tassoul</i>	604	150-E5
FIELD THEORETICAL MODEL FOR NUCLEAR AND NEUTRON MATTER. V. SLOWLY ROTATING WARM CORES IN NEUTRON STARS <i>José V. Romero, J. Díaz Alonso, José M. Ibáñez, Juan A. Miralles, & Armando Pérez</i>	612	150-F5
NEUTRINO ENERGY LOSS IN STELLAR INTERIORS. IV. PLASMA NEUTRINO PROCESS FOR STRONGLY DEGENERATE ELECTRONS <i>Naoki Itoh, Haruhiko Mutoh, Atsushi Hikita, & Yasuharu Kohyama</i>	622	150-G5
A RAPID DECLINE IN THE OPTICAL EMISSION FROM SN 1957D IN M83 <i>Knox S. Long, P. Frank Winkler, & William P. Blair</i>	632	151-A5
SN 1987A: THE IMPACT OF GREATER THAN MeV GAMMA-RAY LUMINOSITY LIMITS ON THEORIES OF PARTICLE ACCELERATION <i>R. K. Sood, L. Waldron, G. K. Rochester, T. J. Sumner, G. Frye, T. Jenkins, R. Staubert, E. Kendziorra, P. Ubertini, & A. Bazzano</i>	637	151-B3
POSTCOLLAPSE HYDRODYNAMICS OF SN 1987A: TWO-DIMENSIONAL SIMULATIONS OF THE EARLY EVOLUTION <i>Marc Herant, Willy Benz, & Stirling Colgate</i>	642	151-B13
LITHIUM DILUTION THROUGH MAIN-SEQUENCE MASS LOSS <i>Fritz J. Swenson & John Faulkner</i>	654	151-D3
ION INJECTION AND FERMI ACCELERATION AT EARTH'S BOW SHOCK: THE 1984 SEPTEMBER 12 EVENT REVISITED <i>M. Scholer, K. J. Trattner, & H. Kucharek</i>	675	151-F1

CONTENTS

	<i>Page</i>	<i>Fiche</i>
ON THE PROCESS OF RESISTIVE HEATING INSTABILITY AND THE FORMATION OF CORONAL LOOP STRUCTURES <i>Yu-Qing Lou</i>	682	151-F13
ENHANCED DAMPING OF ALFVÉN WAVES IN THE SOLAR CORONA BY A TURBULENT WAVE SPECTRUM <i>Robert G. Kleva & J. F. Drake</i>	697	152-A5
HIGH-RESOLUTION PHOTOABSORPTION CROSS SECTIONS OF $E\ ^1\Pi-X\ ^1\Sigma^+$ VIBRATIONAL BANDS OF ^{12}CO AND ^{13}CO <i>G. Stark, P. L. Smith, K. Ito, & K. Yoshino</i>	705	152-B5
RADIATIVE LIFETIMES OF THE CN ($A\ ^3\Pi_u$) ELECTRONIC STATE <i>Richang Lu, Yuhui Huang, & Joshua B. Halpern</i>	710	152-C1
ABSTRACTS OF THE ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES, 1992 SEPTEMBER		
THE COLORADO <i>IUE</i> ACTIVE GALAXY SURVEY. I. BLAZARS <i>Rick Edelson, Gregory F. Pike, Jon M. Saken, Anne Kinney, & J. Michael Shull</i>	715	152-C11
MODELS OF GAS-GRAIN CHEMISTRY IN DENSE INTERSTELLAR CLOUDS WITH COMPLEX ORGANIC MOLECULES <i>Tatsujiro I. Hasegawa, Eric Herbst, & Chun Ming Leung</i>	716	152-C12
SPECTRAL SYNTHESIS IN THE ULTRAVIOLET. IV. A LIBRARY OF MEAN STELLAR GROUPS <i>Michael N. Fanelli, Robert W. O'Connell, David Burstein, & Chi-Chao Wu</i>	716	152-C12
EMISSION-LINE STUDIES OF YOUNG STARS. I. THE T TAURI STARS <i>Fred Hamann & S. E. Persson</i>	717	152-C13
EMISSION-LINE STUDIES OF YOUNG STARS. II. THE HERBIG Ae/Be STARS <i>Fred Hamann & S. E. Persson</i>	717	152-C13
RADIO CONTINUUM AND X-RAY PROPERTIES OF THE CORONAE OF RS CANUM VENATICORUM AND RELATED ACTIVE BINARY SYSTEMS <i>Stephen A. Drake, Theodore Simon, & Jeffrey L. Linsky</i>	718	152-C14
FIRST ORBITS FOR THE VISUAL DOUBLE STARS WDS 00516N2238, WDS 17366N0722, WDS 17563N0259, AND WDS 23020N4800 <i>J. A. Docobo & J. M. Costa</i>	718	152-C14
INTENSIVE HIGH-PRECISION PHOTOMETRIC MONITORING OF THE VARIABLE WN6 WOLF-RAYET STAR HD 191765 <i>I. I. Antokhin, T. R. Irsamambetova, A. F. J. Moffat, A. M. Cherepashchuk, & S. V. Marchenko</i>	718	152-C14
INDEX TO VOLUMES 393-395, PARTS 1 AND 2	i	152-E1

